BERSHOVA, O. I.

"Microbiological Study of the Middle Dnepr", Mikrobiol Zhur, Kiev, Vol. 12, No. 3, pp 3-29, 1950.

BERSHOVA, O. I.

"Microbiological Study of the Middle Dnepr, Report III", Mikrobiol Zhur, Kiev, Vol. 12, No. 4, pp 3-38, 1950.

1. BERSHOVA,O.I.

2. USSR (600)

7. "A Microbiological Investigation of the Middle Dnepr. Report IV", Mikrobiolog. Zhurnal, Vol 13, No 1, 1951, pp 5-19.

9. Mikrobiologiya, Vol XXI, Issue 1, Moscow, Jan-Feb 1952, pp 121-132. Unclassified.

BERSHOVA, O. I.

"The Variability of Azotobacter Under the Influence of Certain Nitrogen Compounds and Microcells", Mikrobiol Zhur, Kiev, Vol. 13, No. 1, pp 32-53, 1951.

RUBENCHIK, L.I.; SMALIY, V.T.; ZINOV'YEVA, Kh.G.; BERSHOVA, O.I.

Activity of local Azotobacter strains from soils of the Ukrainian S.S.R. Mikrobiol.zhur. 13 no.2:3-20 '51. (MLRA 9:9)

1. Iz otdela obshchey mikrobiologii (zav. otdelom - L.I.Rubenchik) Instituta mikrobiologii imeni akademika D.K.Zabolotnogo Akademii nauk USSR.

(UKRAINE--AZOTOBACTER)

BERSHOVA, O.I.

Effect of hexachloran upon soil bacteria. Mikrobiol.zhur. 14 no.4:6-23 '52. (MLRA 6:11)
(Soil microorganisms) (Benzene hexachloride)

BERSHOVA, O.I.

Use of azotobacterin for the soils of the Ukrainian Polesye. O.I. Bershova. Mikrobiol.zhur. 16 no.3:3-13 '54. (MLRA 8:7)

1. Z Institutu mikrobiologii Akademii nauk URSR.
(POLESYE--FERTILIZERS AND MANURES)
(AZOTOBACTER)

ZINOV'YEVA, Khristina Gavrilovna; BERSHOVA, Ol'ga Ippolitovna; RUBENCHIK, L.Y., vidpovidal'niy redaktor; POLYAKOV, M.I., redaktor vidavnitstva; KORMILO, M.T., tekhnicheskiy redaktor

[Azotobacterin and its use in Ukrainian collective farms] Azotobakteryn i ioho zastosuvannia v kolhospakh Ukrainy. Kyiv, Vyd-vo Akademii nauk URSR, 1956. 24 p. (MLRA 10:2)

1. Chlen-korrespondent Akademii nauk URSR (for Rybenchik)
(Azotobacter) (Soil inoculation)

USSR/Soil Science. Organic Fertilizers.

Abs Jour: Ref Zhur-Biol., No 6, 1958, 24792.

Author : Rubenchik L.I., Dershova O.I.
Inst :
Title : Influence of Azotobacterin on the Yield of Agricultural Crops.

Orig Pub: V.sb.: Vopr. razvitiya s.kh. Poles'ya. Kiyev, an ussr, 1956 (1957), 110-117.

Abstract: The structureless soils of Poles'ya, deficient in organic substances, and with an acid reaction, are unfavorable to the vital activity of azotobacterin. In 1952-1953, on fields of a kolkhoz of Kiev oblast, at pH 5.6-5.8 of sod-podsol, the Institute of Microbiology AN USSR conducted

Card : 1/2

BERSHOVA, O.I.

USSR/Microbiology. Soil Microbiology F-3

Abs Jour : Ref Zhur-Biologiya, No 1, 1957, 575

Author : Bershova
Inst :
Title : Effect of Microelements on Soil Bacteria. Report 1. Utilization of Molybdenum by the Culture of the Azotobacter

Orig Pub : Kikrobiologichoiy zh. 1956, No 1, 5-12

Abstract : The method of marked atoms with Mo^{99} having a semidesintegration period of 67 hours was used in the investigations. The method of obtaining a radioactive culture of the azotobacter and the method of its handling are described in detail. It was established that the cells of the azotobacter whether active or quiescent

Card 1/2

USSR/Microbiology. Soil Microbiology F-3

Abs Jour : Ref Zhur-Biologiya, No 1, 1957, 575

Abstract : absorb molybdenum from the medium, with the growing cells absorbing it with considerably greater activity than the old cells. Azotobacter chroococcum (strains K and 53) absorbed more molybdenum than did Azotobacter agile. A part of the absorbed molybdenum entered the encircling medium and was assimilated by hegher plants. When developing in soil containing molybdenum the azotobacter assimilated the latter. The radioactive isotope of molybdenum as well as the stable molybdenum increased the nitrogen fixing capacity of the azotobacter. Bibliography 7 titles

2/2

BERSHOVA, O. I.

All-Union Conference on Bacterial Fertilizers. Mikrobiol.zhur. 18 no.2:68-71 '56. (MLRA 10:9)

1. Z Institutu mikrobiologii AN URSR.
(FERTILIZERS AND MANURES--CONGRESSES)

BERSHOVA, O.I.

The All-Union Conference on Bacterial Fertilizers. Mikrobiologiia 25 no.4:517-520 Jl-Ag '56. (MLRA 9:10)
(FERTILIZERS AND MANURES--CONGRESSES)
(SOILS--BACTERIOLOGY)

USSR / Microbiology. General Microbiology. Physiol- F-1
ogy and Biochemistry.

Abs Jour: Ref Zhur-Biol., No 16, 1958, 71900.

Author : Smaliy, V. T., Bershova, O. I.
Inst : Not given.
Title : Formation of Heteroauxin in Azotobacter Cultures.

Orig Pub: Mikrobiologiya, 1957, 26, No 5, 526-532.

Abstract: Azotobacter was cultivated in agar media. For the determination of heteroauxin (I) Kholodnyy's method was used with isolated coleoptilae. Different cultures of Azotobacter formed different quantities of I. The maximal quantity of I was formed by strains of A. chroococcum K, "Bg," 2 and "Zkh". In a majority of the cultures, the maximal quantity of I is found on the tenth day after culture development. During acid condi-

Card 1/2

BERSHOVA, O.I.

Effect of trace elements on the formation of heteroauxin by soil micro-organisms. Mikrobiol.zhur. 21 no.4:3-10 '59.
(MIRA 12:11)

(GROWTH SUBSTANCES)
(TRACE ELEMENTS pharmacol)
(SOIL microbiol)

BERSHOVA, O.I.

Effect of trace elements on the dehydrogenase activity of rhizosphere bacteria. Mikrobiol. zhur. 22 no. 3:3-9 '60. (MIRA 13:12)

1. Iz Instituta mikrobiologii AN USSR.
(TRACE ELEMENTS) (DEHYDROGENASE)
(RHIZOSPHERE MICROBIOLOGY)

BERSHOVA, O.I.

Respiration intensity of some soil micro-organisms and the effect of trace elements on it. Mikrobiol. zhur. 22 no. 5:14-19 '60. (MIRA 13:10)

1. Institut mikrobiologii AN USSR.
(SOIL MICRO-ORGANISMS) (TRACE ELEMENTS)
(OXIDATION, PHYSIOLOGICAL)

BERSHOVA, O. I.

Activity of decomposition of starch by some rhizosphere microorganisms and the effect of trace elements on it. Mikrobiol. zhur. 23 no.3:13-18 '61. (MIRA 15:7)

1. Institut mikrobiologii Akademii nauk USSR.

(TRACE ELEMENTS) (STARCH)
(RHIZOSPHERE MICROBIOLOGY)

BERSHOVA, O.I.; KOZLOVA, I.A.

Synthesis of vitamins by some rhizosphere micro-organisms and the effect on it of trace elements. Report No. 1. Mikrobiol. zhur. 24 no.2:30-34 '62. (MIRA 15:12)

1. Institut mikrobiologii AN UkrSSR.
(VITAMINS) (TRACE ELEMENTS) (RHIZOSPHERE MICROBIOLOGY)

BERSHOVA, O.I.

Effect of microelements on the formation of heteroauxin and the dehydrase activity of some thirosphere micro-organisms. Trudy Inst. mikrobiol. no.11:301-307 '61 (MIRA 16:11)

1. Institut mikrobiologii AN Ukrainskoy SSR.

*

EMINOV, Ye.A.; SINITSYN, V.V.; OSHER, R.N.; CHEKAVTSEV, N.A.; PATSUKOV, I.P.; USOV, A.A.; FUKS, G.I.; VLADZIYEVSKIY, A.P.; AVDEYEV, A.V.; ARZUMANOV, Sh.P.; PETROV, G.G.; KOZOREZOVA, A.A.; LISITSKIY, K.Z.[deceased]; YAKOBI, M.A.; BELYANCHIKOV, G.P.; IVANOV, V.S.; VORONOV, N.M.; RUMYANTSEV, V.A.; TROFIMUK, V.A.; BERSHTADT, Ya.A.; ZILLER, G.K.; BEREZHNAYA, V.D.; KLEYMENOVA,K.F., ved.red.; TITSKAYA, B.F., ved. red.

[Manual on the use and norms for the expenditure of lubricants] Spravochnik po primeneniiu i normam raskhoda smazochnykh meterialov. 2. perer. i dop. izd. Moskva, Khimiia, 1964. 855 p. (MIRA 18:3)

BERSHTAM, N.S., inzh.; LEYTGOL'D, A.E., inzh.

The VO-10 vibrator for sinking and extracting casings. Gidr. i stroi. 30 no.5:50-51 My '60. (MIRA 14:5)
(Vibrators)
(Oil well drilling)

BERSHTEYN, A.I., inzh.; KONTORER, S.L.

Laying pipelines in marshes without digging ditches. Stroi. truboprov. 7 no.2:18-19 F '62. (MIRA 15:3)
(Pipelines)

BERSHTEYN, A.M., kand. tekhn. nauk; KABUKOVSKAYA, L.N., inzh.

Heating devices. Biul. stroi. tekh. 15 no.5:41-46 My '58.
(MIRA 11:6)

1. Tsentral'nyy nauchno-issledovatel'skiy institut stroitel'stva Akademii stroitel'stva i arkhitektury.
(Radiators)

BERSHTEYN, A.Ya.

USSR/Chemical Technology - Chemical Products and Their Application. Industrial Organic Synthesis. I-1

Abs Jour : Ref Zhur - Khimiya, No 1, 1958, 2142

Author : Bershteyn, A.Ya.

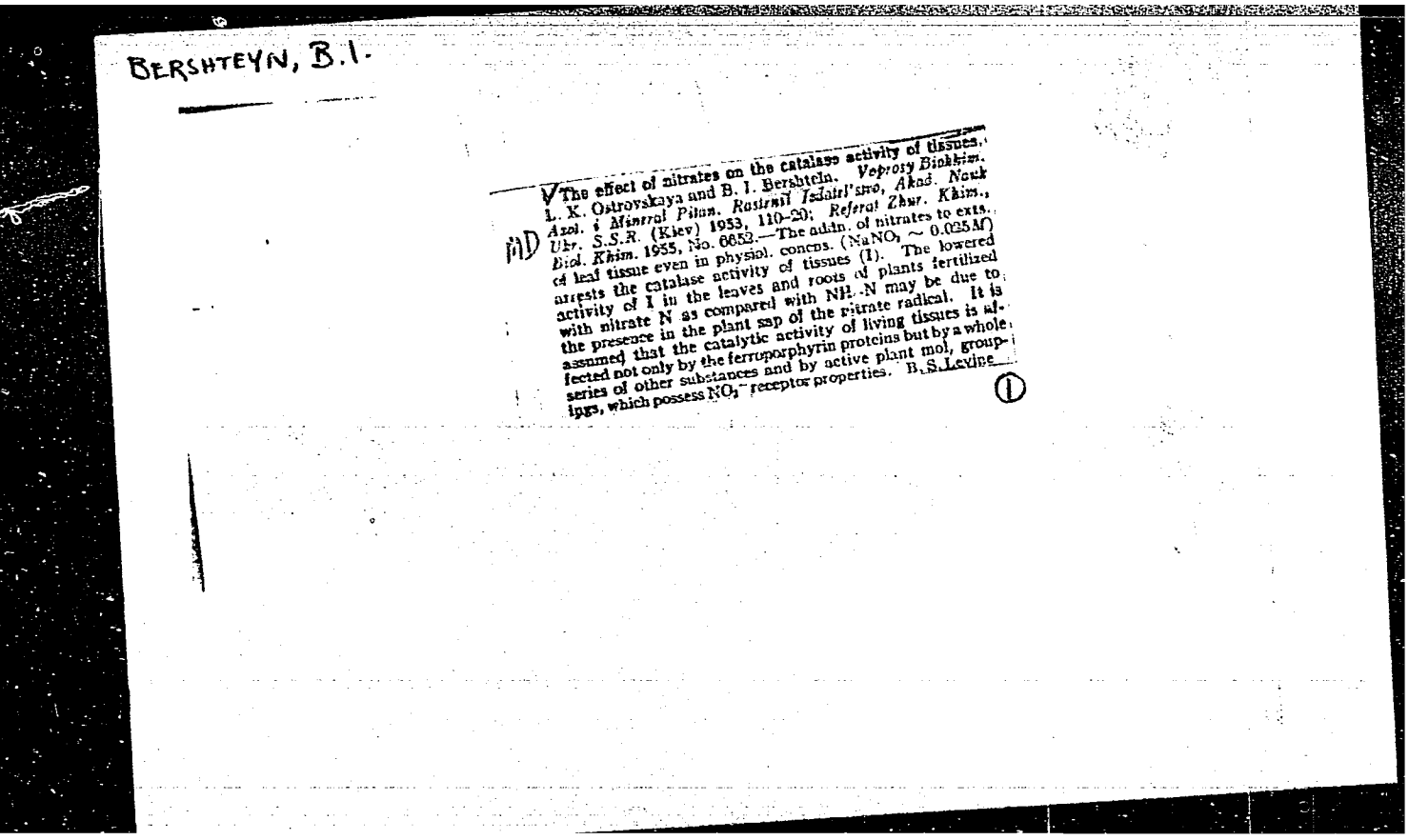
Inst : Academy of Sciences USSR

Title : Industrial Chlorination of Methane.

Orig Pub : Sb.: Khim. perarabotka neft. uglevodorodov. M., AN SSSR, 1956, 329-332

Abstract : The processing was applied to the methane fraction of pyrolysis units, which contained (in % by volume): 72 CH_4, 23 H_2, 2 C_2H_4, 0.5 CO, 0.5 O_2, 2 N_2. The putting in operation of the unit was preceded by experiments with reactors of different design: on conducting the chlorination in a cylindrical reactor, containing a packing of different lump-materials, it was not possible th attain stable

Card 1/2



BERSHTEYN, B.I.

The effect of nitrates on the catalase activity of tissues. L. K. Ostrovskaya and B. I. Bershteln. *Veprosy Biokhim. Azot. i Mineral Pitan. Rastenii Issledovanie, Akad. Nauk Ukr. S.S.R.* (Kiev) 1953, 110-20; *Referat Zhur. Khim., Biol. Khim.* 1955, No. 6653.—The addn. of nitrates to exts. of leaf tissue even in physiol. concns. ($NaNO_3$ ~ 0.025M) arrests the catalase activity of tissues (I). The lowered activity of I in the leaves and roots of plants fertilized with nitrate N as compared with NH_4-N may be due to the presence in the plant sap of the nitrate radical. It is assumed that the catalytic activity of living tissues is affected not only by the ferroporphyrin proteins but by a whole series of other substances and by active plant mol. groupings, which possess NO_3^- receptor properties. B. S. Levine

(1)

OKANENKO, A.S.; BERSHTEYN, B.I.

Studying the biochemical characteristics of potato varieties susceptible and resistant to Synchytrium endobioticum.
Biokhim. pl. i ovoshch. no.4:118-142 '58. (MIRA 11:10)

1. Institut fiziologii rasteniy i agrokhimii AN USSR.
(Potato wart)

OKANENKO, A.S.; BERSHTEYN, B.I.; POCHINOK, Kh.N.; GAMAYUNOVA, M.S.

Characteristics of biochemical processes occurring during "Gothic" degeneration of potatoes. Biokhim. pl. i ovoshch. no.4:164-182 '58. (MIRA 11:10)

1. Institut fiziologii rasteniy i agrokhimii AN USSR.
(Potatoes--Diseases and pests)

AUTHORS: Bershteyn, B. I., Fomyuk, M. K., SOV/ 20-120-2-58/63
Okanenko, A. S.

TITLE: The Influence of the Degeneration of the Type "Gothic" (Spindle-Tuber) on the Amino Acid Content in Potato Tubers (Vliyaniye vyrozhdeniya tipa gotiki na soderzhaniye aminokislot v klubnyakh kartofelya)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 120, Nr 2, pp. 425-428 (USSR)

ABSTRACT: Among the processes that accompany the degeneration of potatoes, the derangement of the nitrogen-metabolism is the most characteristic one. It was proved in several works (references 1,2) that in the case of an affection with "gothic", a double amount of non-protein is contained in the potato tubers, especially of amino nitrogen as compared to the healthy ones. Essential differences concerning protein-nitrogen were not reported. Table 1 shows data on the mentioned nitrogen-contents. These data show that independently from the origin of the gothic degeneration (whether caused by different forms of nutrition or by artificial affection), analogous derangements of the nitrogen-metabolism are caused

Card 1/4

with different types of potatoes. Table 1 shows a considerable increase of amino-nitrogen in the tubers, in the case of an affection by "gothic". In order to clarify variations in the existence of the free amino acids, healthy and diseased tubers were investigated by means of two-dimensional distribution-chromatography. Furthermore the existence of amino acids of the protein hydrolyzate was determined. The main part of the proteins and of the free amino acids is concentrated in the juice of the tubers (references 3-5). In the 70° ethanol extract no differences could be proved, but the chromatograms of the amino acids in the juice were more distinct. The methodology of determination is described. Table 2 and figure 1 show the results. On table 2 we can see that the juice of the degenerated tubers contains 17 amino acids (among them 2 amides), whereas in the juice of healthy tubers there are only 12 amino acids. In the degenerated tubers there is 2 to 3 times more asparagine, glutamine of

the group: Methionine + valine + tryptophane and of the leucine group, but less cystein, glutamine acid and asparagine acid than in healthy ones. In the latter ones no α- alanine, α- and γ-amino butyric acid, proline and tyrosine were determined. The amount of amino nitrogen is the same in the proteins of diseased and healthy tubers. After the separation of the protein hydrolyzate by means of chromatography, in the proteins of both, healthy and degenerated tubers, 15 amino acids were determined. Comparing the data of Mul'der and Bakema (Mulder and Bakema), (reference 5) with the results obtained by the authors, one can recognize that a surplus nitrogen-nutrition changes the nitrogen-metabolism in the same direction as the gothic disease. A surplus of potassium and phosphorus acts in a contrary direction. The too extensive nitrogen nutrition increases the susceptibility to gothic, whereas potassium and phosphorus increase the resistance against it (references 7-9). There are 2 figures, 2 tables, and 12 references, 8 of which are Soviet.

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000205020016-5"

The Influence of the Degeneration of the Type "Gothi..." SOV/20-120-2-58/63
(Spindle-Tuber) on the Amino Acid Content in Potato Tubers

ASSOCIATION: Ukrainskiy nauchno-issledovatel'skiy institut fiziologii rasteniy (Ukrainian Scientific Research Institute for Plant-Physiology)

PRESENTED: December 20, 1957, by A. L. Kursanov, Member, Academy of Sciences, USSR

SUBMITTED: March 30, 1957

1. Potatoes--Pathology 2. Potatoes--Chromatographic analysis
3. Amino acids--Determination

Card 4/4

BERSHTEYN, B.I.; LEONT'YEVA, Yu.A.; OKANENKO, A.S.

Effect of different types of degeneration on the amino acid content of potato tubers. Dokl.AN SSSR 134 no.4:976-979 O '60. (MIRA 13:9)

1. Ukrainskiy nauchno-issledovatel'skiy institut fiziologii rasteniy. Predstavelno akademikom A.I. Oparinym.
(POTATOES--DISEASES AND PESTS)
(AMINO ACIDS)

BERSHTEYN, B. I., REYNGARD, T. A., and OKANENKO, A. S. (USSR)

"The Proteins and Nucleic Acids of the Cancerous Warts in Potatoes Infected with Synchitrium endobioticum."

Report presented at the 5th International Biochemistry Congress, Moscow, 10-16 Aug 1961

OKANENKO, A.S.; REYNGARD, T.A.; BERSHTEYN, B.I.; OSTAPLYUK, A.N.

Biochemical characteristics of normal and degenerated potatoes. Biokhim.pl.i ovoshch. no.7:85-95 '62. (MIRA 16:1)

1. Ukrainskiy nauchno-issledovatel'skiy institut fiziologii rasteniy.

(Potatoes—Diseases and pests)

BERSHTEYN, D. O.

USSR/Chemical Technology. Chemical Products and Their Application -- Silicates. Glass. Ceramics. Binders, I-9

Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 5342

Author: Bershteyn, D. O., Krass, Ya. R.

Institution: None

Title: Experience with Production of Xylolith Articles with the Use of Local Magnesia Binders

Original Publication: Stroit. prom-st', 1956, No 6, 32-33

Abstract: Information is given concerning the technology, developed by Yuzhuralmetallurgstroy and TsNIPS in 1955, of the production of xylolith articles on the base of waste of the "Magnezit" plant (magnesia dust). At the present time the trust produces sectional xylolith partition panels 1,500 x 500 x 80 mm. Compression strength of the panels, after 7 days, is of 34.2 kg/cm^2, volumetric weight 1,100 kg/m^3, weight of 1 m^2 of the panel is 65-70 kg.

Card 1/1 Starshiy nauchnyy sotrudnik Magnitogorskogo filiala Tsentral'nogo nauchno-issledovatel'skogo inst. promyshlennykh sooruzheniy (for Bershteyn) 2. Nachal'nik Tsentral'noy stroitel'noy laboratorii tresta Yuzhuralmetallurgstroy (for Krass)

BERSHTEĬN, D. O. AND EVGENII OSKAROVICH PATON AND GORBUNOV, B. M.

Opir zvarnykh spoluk pry vibratsiinomu navantazhenni. Kyiv, AN USRS, 1936.
41 p. diagrs., illus.

Summary in German.

Resistance of welded joints under vibration load.

CLU NN

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

BERSHTEYN, D.O.; VOYTSKHOVSKIY, A.A.; ZABOROV, V.I.

Prestressed 3x12m panels to be used for roofs of industrial buildings. Stroi. prom. 35 no.12:35-37 D '57. (MIRA 11:1)

1. Ural'skiy filial Akademii stroitel'stva i arkhitektury SSSR.
(Roofs, Concrete)

BERSHTEYN, G.M., inzh.; MUZYCHENKO, F.I., inzh.; SINITSYN, B.S., inzh.

Small hydraulic drag. Transp. stroi. 12 no.1:51-52 Ja '62.
(MIRA 17:2)

AZAREVICH, G.M., kand.tekhn.nauk; BERSHTEYN, G.Sh., inzh.

Use of plastic deformation in machining cylindrical surfaces. Trakt. i sel'khozmash. 32 no.1:38-42 Ja '62. (MIRA 15:2)

1. Nauchno-issledovatel'skiy institut tekhnologii traktornogo i sel'skokhozyaystvennogo mashinostroyeniya.
(Machine-shop practices)

ACC NR: AP7002619 (A, N) SOURCE CODE: UR/0413/66/000/023/0135/0135

INVENTOR: Azarevich, G. M.; Savel'yeva, L. B.; Bershteyn, G. Sh.

ORG: None

TITLE: A device for finishing and hardening flat ring-shaped components on both sides. Class 67, No. 189325 [announced by the Scientific Research Institute of Tractor and Agricultural Machine Building Technology (Nauchno-issledovatel'skiy institut tekhnologii traktornogo i sel'skokhozyaystvennogo mashinostroyeniya)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 23, 1966, 135

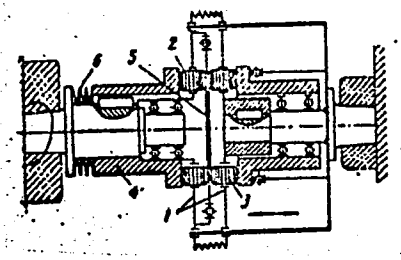
TOPIC TAGS: finishing machine, surface hardening

ABSTRACT: This Author's Certificate introduces a device for finishing and hardening flat ring-shaped components on both sides. The unit contains two rows of deforming rollers located in separators, and two back-up elements for them. The device is designed for increased productivity and for handling thin unsecured components. Both separators are nonrotatable and each of the rollers in one row is located opposite the corresponding roller in the other row during the finishing process. One of the back-up elements, mounted so that it can be moved axially, rotates the rollers and component and is acted upon by an elastic element (e. g. a spring) which applies a constant deformation force.

Card 1/2 UDC: 621.923.77.02-477

0930 2757

ACC NR: AP7002619



1—separators; 2—drive rollers; 3—driven rollers; 4—back-up element; 5—workpiece; 6—spring

SUB CODE: 13/ SUBM DATE: 27Dec65

Card 2/2

AZAREVICH, G.M., kand.tekhn.nauk; BERSHTEYN, G.Sh.

Automatic machine for the finishing and hard-facing of shaft-type parts. Biul.tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch. i tekh.inform. no.2:44-46 '63. (MIRA 16:2)
(Machine tools)

BERSHTEYN, I. BERSHTEYN. I.

SUBJECT USSR/MATHEMATICS/Differential equations CARD 1/2 PG - 637
AUTHOR BERSTEIN I., CHALANAI A.:
TITLE The index of the singular point and the existence of periodic solutions for systems with a small parameter.
PERIODICAL Doklady Akad.Nauk 111, 923-925 (1956)
reviewed 3/1957

Let be given the system

(1) $$\frac{dx}{dt} = X(x) + \mu Y(x,t,\mu), \qquad x \in E^n,$$

where X and Y are n-dimensional vector functions and Y has the period ω in t. Let the coordinate origin be an isolated singular point of the generating system

(2) $$\frac{dx}{dt} = X(x).$$

In a certain neighborhood Ω of the coordinate origin let all conditions be satisfied which guarantee the uniqueness of the solution and its continuous dependence on the initial conditions and μ.
The authors prove two theorems:
1. If the singular point of (2) is no vortex and its index is different from zero, then for sufficiently small μ, (1) possesses a periodic solution which

for $\mu \to 0$ tends to the singular point of (2).
2. If the index equals two and in a certain neighborhood of the singular point there exists a periodic solution of (2) with the period ω', where $\omega' \neq \omega$, then for sufficiently small μ there exists a periodic solution of (1) with the period ω.

INSTITUTION: Math.Inst. Acad. Rumanian Republ.,Bukarest.

BERSHTEYN, I.

PA - 2902

AUTHOR BERSTEYN I.

TITLE On the problem of periodical solutions of non-linear systems with small parameter. (K voprosu o resheniyakh periodicheskikh nelineynykh sistem s malym parametrom.- Russian)

PERIODICAL Doklady Akademii Nauk SSSR 1957, Vol 113, Nr 1, pp 9-11 (USSR).

Received: 5/1957 Reviewed: 7/1957

ABSTRACT Dealing with the theory of non-linear oscillations qualitative theorems are necessary on the behaviour of the periodic solutions in the case of small, constantly acting perturbations. These theorems must be independent from any specific properties of these perturbations. As a specialized case the following problem is given: Let the periodic solution by asymptotically steady (i.e. this solution is conserved in a certain way in the case of small modifications of the initial values.). Can it be maintained on these assumptions that a periodic solution exists in a certain neighbourhood of this solution in the case of small perturbations which act continually? The present paper intends to answer this question.

The author investigates the system of equations:

$$dx/dt = \overline{X}(x,t) + \mu Y(x,t,\mu).$$

CARD 1/3

PA - 2902

On the problem of periodical solutions of non-linear systems with small parameter.

Here it applies that $x = (x_1,\ldots,x_n)$, $X = (X_1,\ldots,X_n)$, $Y = (Y_1,\ldots,Y_n)$. In this case $X(x,t)$, $Y(x,t,\mu)$ are continuous vector functions, which are periodical with respect to time with the period ω, and which are defined for $|x| \leqslant \rho$ and every $t(|x|) = \sqrt{x_1^2+\ldots+x_1^2}$. In addition, the following is assumed:

The uniqueness of the solutions and their continuous dependence on the initial values and on the parameter μ are to be guaranteed in an arbitrary cylinder $|x| \leqslant \rho$, $0 \leqslant t \leqslant T$. The trivial solution $x = 0$ of the deviving system $dx/dt = X(x,t)$ is asymptotically steady.

Theorem: If the aforementioned conditions mentioned are satisfied, the system of equations written down above permits periodic solutions for $|\mu| < \mu_0$, which are in the neighbourhood of the solution $x = 0$ of the system $dx/dt = X(x,t)$.

CARD 2/3

On the problem of periodical solutions of non-linear systems with small parameter. PA-2902

This theorem is then proved step by step with the help of a topological lemma.
(No illustrations)

ASSOCIATION: Mathematical Institute of the Academy of the Roumanian Peoples Republic, Bucarest.
PRESENTED BY: I.G. PETROVSKIY, Member of Academy.
SUBMITTED: 7.12. 1955.
AVAILABLE: Library of Congress.

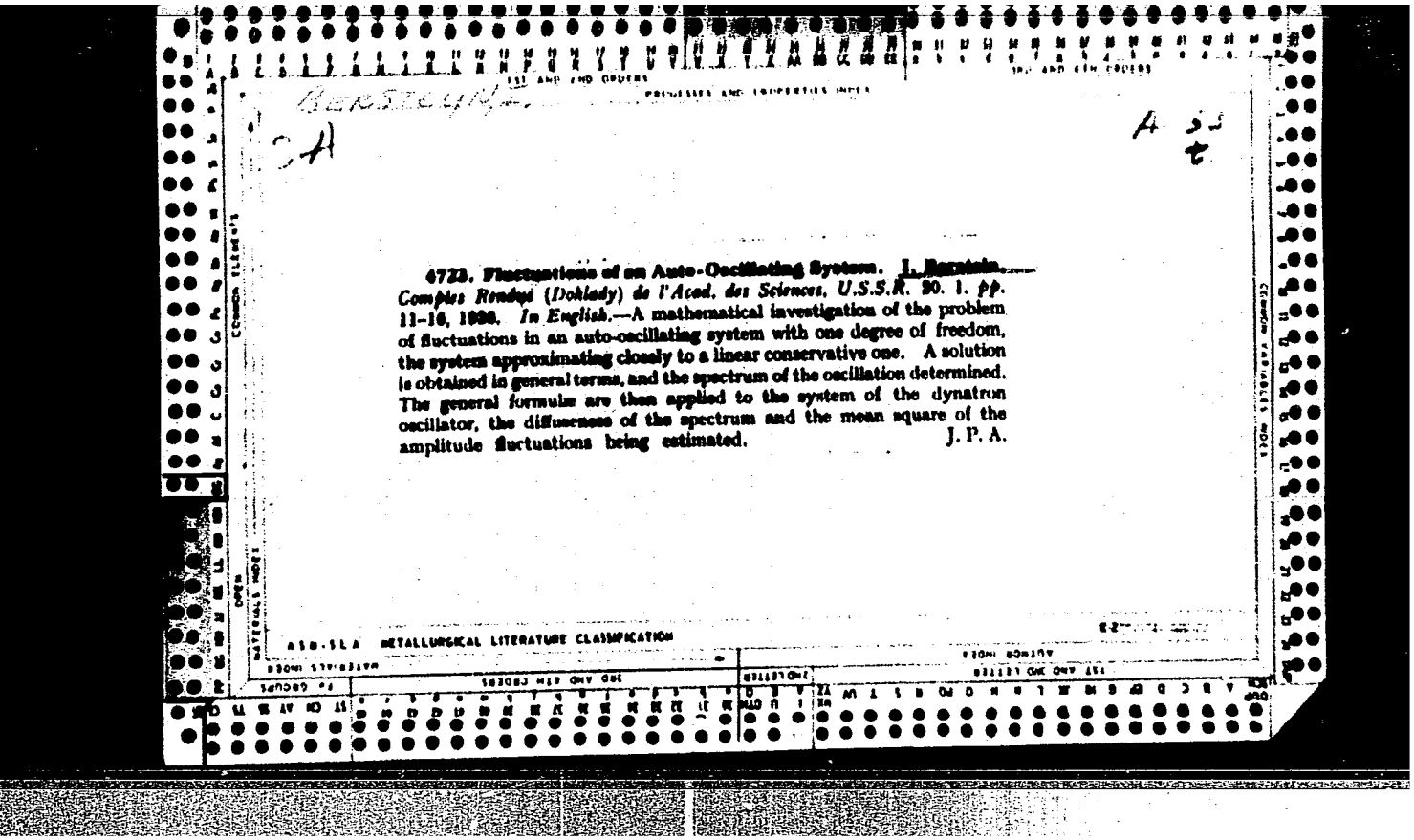
CARD 3/3

STOILOV, Simon [Stoilow, S.], akademik; BERSHTEYN, I.[translator]; SOLOMENTSEV, Ye.D., red.; PRIDANTSEVA, S.V., tekhn. red.

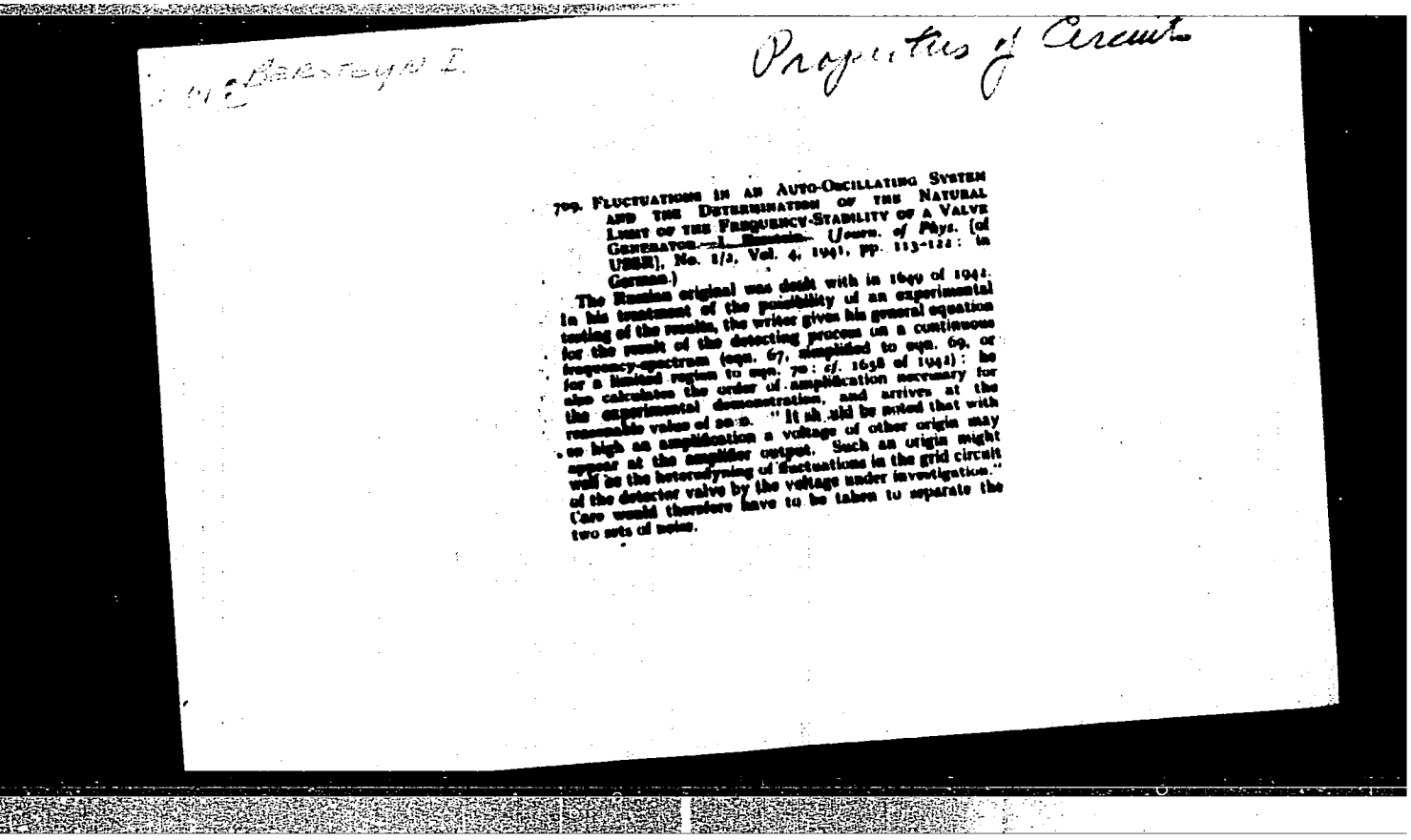
[Theory of functions of complex variables]Teoriia funktsii kompleksnogo peremennogo. Moskva, Izd-vo inostr.lit-ry. Vol.1.[Fundamental concepts and principles]Osnovnye poniatiia i printsipy. 1962. 364 p. Translated from the Rumanian. (MIRA 15:9)
(Functions of complex variables)

STOILOV, Simon[Stoilow, Simion (deceased)], akademik; BERSHTEYN, I. [translator]; PLUZHNIKOVA, N.I., red.; PRIDANTSEVA, S.V., tekhn. red.

[Theory of functions of complex variables]Teoriia funktsii kompleksnogo peremennogo. Moskva, Izd-vo inostr. lit-ry. Vol.2. (Napisan pri sotrudnichestve Kabirii Andreian Kazaku). 1962. 416 p. Translated from the Rumanian. (MIRA 15:12)
(Functions of complex variables)



4723. **Fluctuations of an Auto-Oscillating System.** L. Rantzin. *Comptes Rendus (Doklady) de l'Acad. des Sciences, U.S.S.R.* 30. 1. pp. 11–16, 1936. *In English.*—A mathematical investigation of the problem of fluctuations in an auto-oscillating system with one degree of freedom, the system approximating closely to a linear conservative one. A solution is obtained in general terms, and the spectrum of the oscillation determined. The general formulæ are then applied to the system of the dynatron oscillator, the diffuseness of the spectrum and the mean square of the amplitude fluctuations being estimated. J. P. A.



Properties of Circuit

709. Fluctuations in an Auto-Oscillating System and the Determination of the Natural Limit of the Frequency-Stability of a Valve Generator.—I. Shmaiov. (*Journ. of Phys.* [of USSR], No. 1/2, Vol. 4, 1941, pp. 113-122: in German.)

The Russian original was dealt with in 1649 of 1942. In his treatment of the possibility of an experimental testing of the results, the writer gives his general equation for the result of the detecting process on a continuous frequency-spectrum (eqn. 67, simplified to eqn. 69, or for a limited region to eqn. 70: cf. 1638 of 1942): he also calculates the order of amplification necessary for the experimental demonstration, and arrives at the reasonable value of 20 db. "It should be noted that with so high an amplification a voltage of other origin may appear at the amplifier output. Such an origin might well be the heterodyning of fluctuations in the grid circuit of the detector valve by the voltage under investigation." Care would therefore have to be taken to separate the two sets of noise.

BERSHTEYN, I.

"On the Phenomenon of Induction and the Inter-Reaction of Perpendicular Magnetic Fields," Dokl. AN SSSR, 43, No.9, 1944.

Phys. Tech. Inst., Gor'kiy U.

PA 20T61

BERSHTEYN, I. L.

USSR/Radio Dec 1946
Circuits - Analysis
Modulation Theory

"A Self-modulated Circuit," I. L. Bershteyn, Candidate of Physico-mathematical Sciences, 4 pp

"Radiotekhnika" Vol I, No 9

The theory of a valve oscillator acted upon by a reflected signal the frequency of which is altered by the Doppler-effect.

20T61

BERSHTEYN, I.

"Fluctuations in Tube Oscillators," Dokl. AN SSSR, 68, No.3, 1949.

Gor'kiy Res. Physico-Tech. Inst., Gor'kiy State U.

BERNSHTEYN, I. L.

PA 160T94

USSR/Physics - Oscillators, Tube Nonlinear Mechanics — Mar/Apr 50

"Amplitude and Phase Fluctuations in Tube Oscillators," I. L. Bernshteyn, Physicotech Inst, Gor'kiy State U, 28 pp

"Iz Ak Nauk SSSR, Ser Fiz" Vol XIV, No 2

Studies auto-oscillatory system described by

$$\dot{x} = \omega_0 y + F(x,y) + f_1(t)$$
$$\dot{y} = \omega_0 x + G(x,y) + f_2(t)$$

where x is the current; y, voltage; omega,

[redacted] 160T94

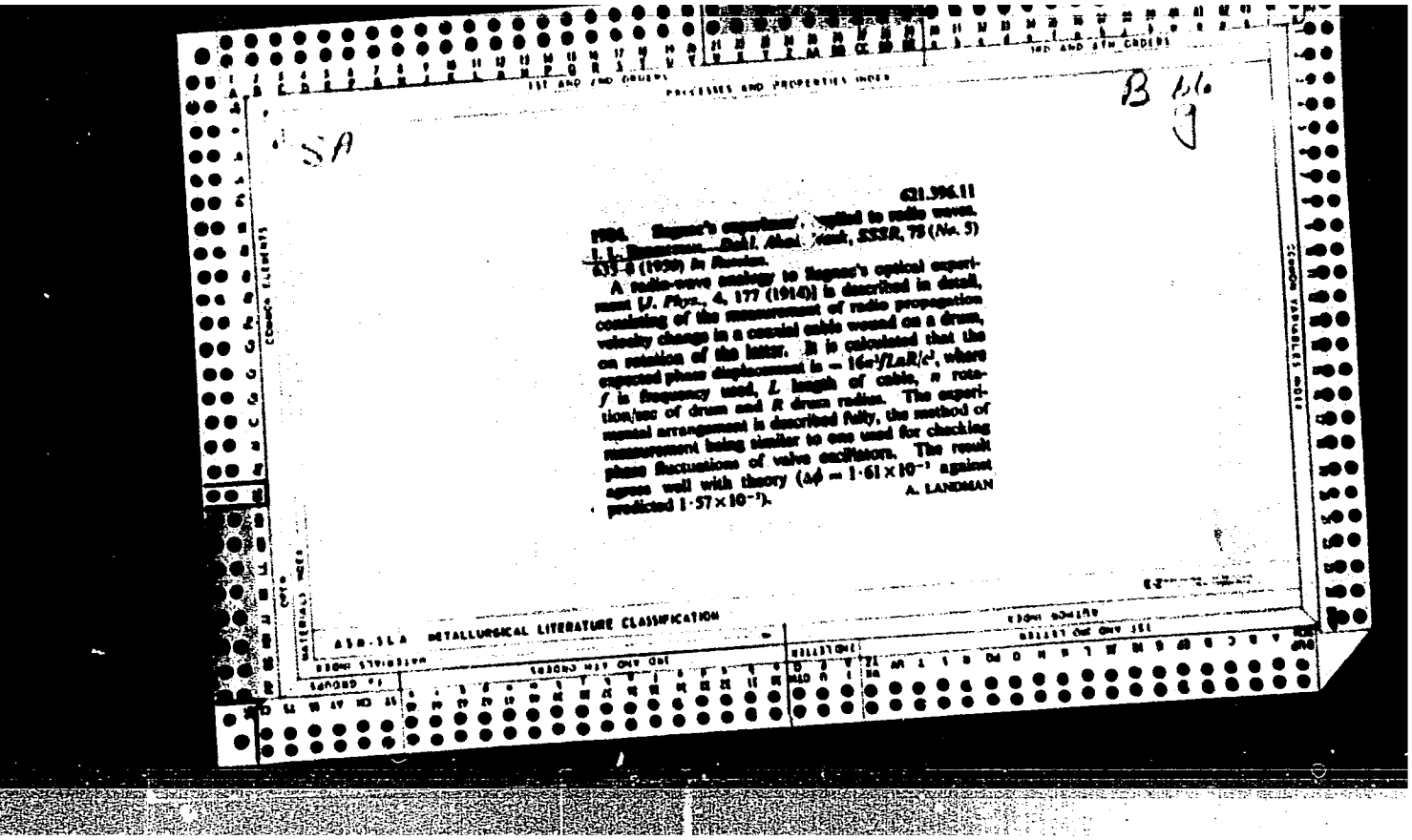
USSR/Physics - Oscillators, Tube (Contd) — Mar/Apr 50

frequency of linear system; F and G, small non-conservative terms; f_1 and f_2, "chance" excitations on system caused by thermal fluctuations and "shot" effect. Substitution

$$x = R\cos\theta,\ y = R\sin\theta$$

is made. Averaging formulas are then calculated for various parameters, taking into account "chance" character of $f_1(t)$ and $f_2(t)$, to obtain average fluctuations in amplitude $\bar{A}$ and phase $\bar{z}$.

[redacted] 160T94



621.396.11

1954. Slepian's experiment applied to radio waves. I. L. Bershtein. *Dokl. Akad. Nauk, SSSR*, 78 (No. 5) 875–8 (1950) *In Russian.*

A radio-wave analogy to Slepian's optical experiment [*J. Phys.*, 4, 177 (1941)] is described in detail, consisting of the measurement of radio propagation velocity change in a coaxial cable wound on a drum, on rotation of the latter. It is calculated that the expected phase displacement is $-16\pi^2 fLnR/c^2$, where f is frequency used, L length of cable, n rotation/sec of drum and R drum radius. The experimental arrangement is described fully, the method of measurement being similar to one used for checking phase fluctuations of valve oscillators. The result agrees well with theory ($\Delta\phi = 1{\cdot}61 \times 10^{-1}$ against predicted $1{\cdot}57 \times 10^{-1}$).

A. LANDMAN

PA 234T69

USSR/Astronomy - Stellar Interferometer of Michelson 1 Sep 52

"Theory of Michelson's Stellar Interferometer," I. L. Bershteyn, G. S. Gorelik, Phys-Tech Inst, Gor'kiy State U

"Dok Ak Nauk SSSR" Vol 86, No 1, pp 47-50

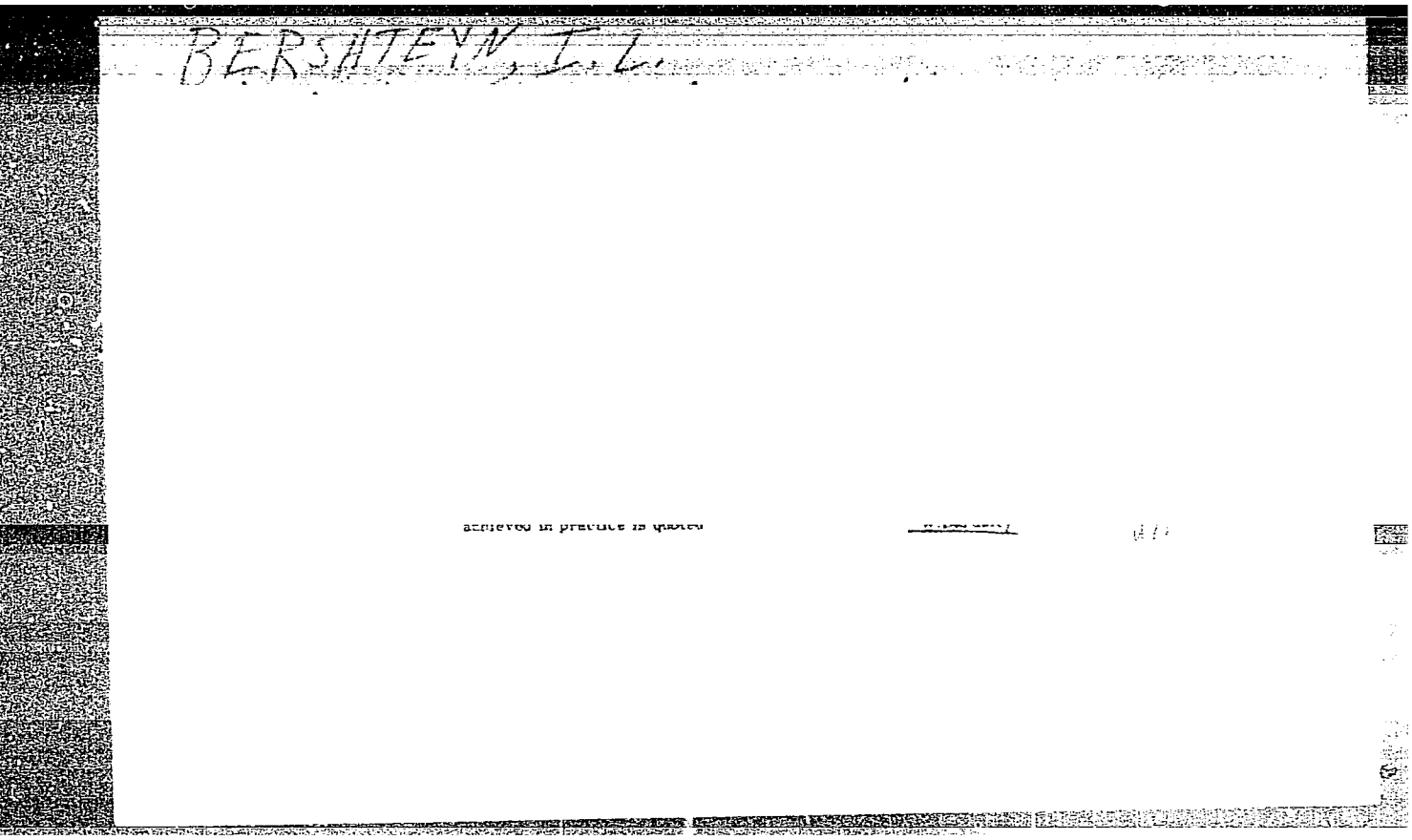
Subject interferometer permits measuring the angular diam psi of a star by means of an observation of the variation in visibility V(s,psi) of the interference picture in dependence on the distance s between mirrors M_1M_4 (basis). Authors conclude that angular

234T69

diams of stars considerably less than lambda/s can be measured with a given basis s by means of subject interferometer. Submitted by Acad M. A. Leontovich 30 Jun 52.

234T69

BERSHTEYN, I. L.



BERSHTEYN, IZRAIL' LAZAREVICH

BERSHTEYN, Izrail' Lazarevich.

BERSHTEYN, Izrail' Lazarevich, Academic Degree of Doctor of Physico-Mathemathical Sciences, based on his defense, 17 February 1955, in the Council of the inst of Radio Engineering and Electronics of the Acad Sci USSR, of his dissertation entitled: "Reserch on infinitesimal changes of differences of phases in Radio and Optics". For the Academic Title of Doctor of Sciences.

SO: Byulleten' Ministerstva, Vysshego Obrazovaniya SSSR, list No 19, 24 Sept. 1955, Decision of Higher Certification Commission Concerning Academic Degrees and Titles.

BERSHTEYN, I. L.

Category : USSR/General Problems - Method and Technique of Investigation A-4

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 138

Author : Bershteyn, I.L.
Title : Measurement of Very Small Mechanical Displacements

Orig Pub : Pamyati Aleksandra Aleksandrovicha Andronova, M., Izd-vo AN SSSR, 1955, 577-581

Abstract : The author employs the method used in radiophysics, where the change of the phase difference of two oscillations is measured. A detailed theory is given for the method of observation and measurement of very small periodic changes in the difference of phase of two optical oscillations. A method is described for direct quantitative measurement of very small displacements. The potentialities of the method are evaluated and it is shown that using simple optical apparatus and an incandescent-lamp light source it is possible to observe displacements on the order of several thousandths of an Angstom. The theoretical calculations were experimentally verified.

Card : 1/1

BERSHTEYN, I.L.

621.373.4.029.6: 621.398.822

1997

Fluctuation of Oscillations of Klystron Generator.

I. L. Bershtein. (*C. R. Acad. Sci. U.R.S.S.*, 21st Jan. 1956, Vol. 106, No. 3, pp. 453–456. In Russian.)

A theoretical investigation of noise in a reflex klystron is presented. In a typical case the natural bandwidth of the oscillations is 0·1 c/s; the results obtained by Shimoda (2943 of 1953) are believed to be in error.

BERSHTEYN, I. L.

AUTHOR: Bershteyn, I.L.

"Phase Stabilization of the Frequency of Microwave Generators,"
A-U Sci Conf dedicated to "Radio Day," Moscow, 20-25 May 1957.

PERIODICAL: Radiotekhnika i Electronika, Vol. 2, No. 9, pp. 1221-1224, 1957, (USSR)

BERSHTEYN, I. L.

109-7-17/17

AUTHOR: Bershteyn, I.L. and Sibiryakov, V.L.

TITLE: Phase Method of Stabilization of Micro-wave Oscillators. (Fazovaya stabilizatsiya mikrovolnovykh generatorov) (Letter to the Editor)

PERIODICAL: Radiotekhnika i Elektronika, 1957, Vol.II, No.7, p. 944 (USSR).

ABSTRACT: An experimental investigation of a klystron generator operating at 3.3 cm wavelength was carried out. The source of the stabilising oscillations was a quartz crystal oscillator with a frequency-multiplier operating at 450 Mc/s. The twentieth harmonic of this frequency was used to produce 60 Mc/s beats with the klystron frequency. The beats were amplified and then combined in a balanced detector with a separate local oscillator operating at 60 Mc/s. The output voltage of the balanced detector was amplified and applied to the reflector of the klystron. The above system permitted the stabilisation of the klystron over a frequency range of about 5 Mc/s. The power of the stabilising signal was about 0.4 μW. There are 2 references, 1 of which is Slavic.

Card 1/2

109-7-17/17

Phase Method of Stabilization of Micro-wave Oscillators.

ASSOCIATION: Radio-physical Institute of the Gorkiy University. (Radiofizicheskiy Institut pri Gorkovskom Universitete)

SUBMITTED: February 25, 1957.

AVAILABLE: Library of Congress.

Card 2/2

109-3-2-20/26

AUTHOR: Bershteyn, I.L.

TITLE: Theory of the Phase-type Automatic Frequency Trimming (K teorii fazovoy avtopodstroyki chastoty)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol.III, No.2, pp. 288 - 290 (USSR).

ABSTRACT: The simplest automatic frequency-control system (see the figure on p.288) can be described as follows: the outputs of an oscillator and an external (control) signal are applied to a detector whose output is applied to a frequency-controlling element (e.g. a reactance valve). The frequency of the oscillator in this system can be expressed by Eq.(1), in which S is the so-called control slope and v_2 can be written in the form of Eq.(2). The function $L(\bar{v})_1$ in Eq.(2) is given by the frequency characteristic of the system, while $f_2(t)$ is a random time function causing the fluctuations in the control system. The phase variation of the system can be expressed by Eq.(6), from which the spectral density of the phase fluctuation can be expressed by Eq.(7), where $B(\Omega)$ is given by Eq.(8), while $W_1(\Omega)$ and $W(\Omega)$ are the spectral densities of the functions $f_1(t)$ and $f_2(t)$, respectively.

Card1/2

Theory of the Phase-type Automatic Frequency Trimming

When $W_2 = 0$, the spectral density fluctuations can be expressed by Eq.(10), where $\delta\omega$ is a random deviation of frequency due to technical causes. On the other hand, when $W_1 = 0$, the phase fluctuation can be described by Eq.(12), in which Π is the effective bandwidth of the system, N is the noise figure, T is the absolute temperature and P_c is the power of the synchronising signal applied to the detector. Eqs.(10) and (12) are used to evaluate the root mean square phase deviation of practical systems; these deviations are found to be of the order of 0.1 to 0.3^0. There are 1 figure and 4 Russian references.

ASSOCIATION: Gor'kiy Radiophysics Institute
(Gorkovskiy radiofizicheskiy institut)

SUBMITTED: June 24, 1957
AVAILABLE: Library of Congress

Card 2/2

1. Frequency-Control systems 2. Mathematics-Theory

AUTHORS: Bershteyn, I.L. and Sibiryakov, V.L. 109-3-2-21/26

TITLE: Phase-type Automatic Frequency Adjustment in Microwave Oscillators (Fazovaya avtopodstroyka chastoty generatorov santimetrovykh voln)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol.III, No.2, pp. 290 - 291 (USSR)

ABSTRACT: The problem was investigated experimentally by means of the equipment shown in the figure on p.290. This employed a quartz stabilised oscillator operating at 75 Mc/s; this was followed by two frequency multiplier stages producing a frequency of 450 Mc/s. The resulting signal was applied to a germanium diode and its twentieth harmonic, having a frequency of 9 000 Mc/s, was used as the standard synchronisation signal. The synchronising power was of the order of 1 μW and the frequency of the synchronised klystron was about 75 Mc/s lower than that of the standard. The standard signal and the klystron oscillations were applied to the input of a balanced detector; an intermediate frequency of 75 Mc/s, obtained at the output of the detector, was amplified and applied to another balanced detector, where it was mixed with the frequency of the quartz oscillator. The detector was followed by a single-stage video-amplifier, whose output was applied to the reflector

Card1/2

Phase-type Automatic Frequency Adjustment in Microwave Oscillators

of the klystron. The system had a pull-in bandwidth of ± 4 Mc/s and a synchronisation bandwidth of ± 15-20 Mc/s.

There are 1 figure and 3 Russian, 1 English references.

ASSOCIATION: Gor'kiy Radiophysics Institute
(Gor'kovskiy radiofizicheskiy institut)

SUBMITTED: June 24, 1957

AVAILABLE: Library of Congress

Card 2/2

1. Microwave oscillators 2. Granium diodes 3. Klystrons

SOV/109-3-11-8/13

AUTHORS: Bershteyn, I.L. and Sibiryakov, V.L.

TITLE: On the Problem of Automatic Phase-frequency Trim in Microwave Oscillators (K voprosu o fazovoy avtopodstroyke chastoty generatorov santimetrovykh voln)(Letter to Editor)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol 3, Nr 11, p 1399 (USSR)

ABSTRACT: In connection with the letter of Professor Standberg (Ref 1), the authors point out that their misinterpretation of Standberg's paper (Ref 2) was due to an extremely short statement of his results.
There are 2 English references.

SUBMITTED: June 30, 1958

Card 1/1

06343
SOV/141-2-1-15/19

AUTHORS: Bershteyn, I.L., Dryagin, Yu.A., Sibiryakov, V.L.

TITLE: Stable-frequency Power Oscillator Provided by a Molecular Oscillator

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1959, Vol 2, Nr 1, pp 130 - 131 (USSR)

ABSTRACT: An ammonia source works at too short a wavelength (λ = 1.25 cm) and too low a power (10^{-9} to 10^{-10} W) to be generally useful. The present proposal reduces the frequency by 8 times and increases the power to some tens of mW while inheriting a large amount of stability. The basic principle is the phase-lock loop described in Refs 1, 2 and 3 (M. Kaplanov, V. Levin and the author). In the diagram of Figure 1, the klystron to be stabilised, a K-12 operating at 2983.75 Mc/s, diverts 10 mW into a germanium diode multiplier and its 8-th harmonic feeds a balanced mixer whose other input is the 3rd harmonic of a K-18 klystron working at 7978.33 Mc/s. This latter frequency is also used as an input to another balanced mixer connected to the ammonia source. The outputs of each balanced mixer are intermediate frequency signals

Card1/2

Stable-frequency Power Oscillator Provided by a Molecular Oscillator

at 65 Mc/s. That obtained from mixing the two klystrons is amplified (gain X50, bandwidth 7 Mc/s) and applied to a balanced phase detector. The "reference" channel to the detector has a gain of X3000 and a bandwidth of 1 Mc/s. The output of the phase detector, via a video amplifier, controls the K-12 klystron. The frequency of the K-18 local oscillator is stabilised with reference to a crystal-controlled oscillator. The phase loop has a capture bandwidth of 0.5 Mc/s. The mean square phase deviation of the stabilised klystron is 0.2°. The work was carried out in the IRE Laboratories of the Ac.Sc., USSR. M.Ye. Zhabotinskiy is thanked for assistance. There are 1 figure and 3 Soviet references.

ASSOCIATION: Issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Radiophysics Research Institute of Gor'kiy University)

SUBMITTED: November 17, 1958

Card2/2

16.8100, 16.8300

77014
SOV/56-37-6-54/55

AUTHORS: Bershteyn, I. L. and Gertsenshteyn, M. E.

TITLE: Possibility of Measuring the Velocity of Gravitational Distribution under Laboratory Conditions

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 6, pp 1832-1833 (USSR)

ABSTRACT: A theoretical analysis was carried out for an experiment which would involve the measurement of the propagation velocity of gravity. The gravitational field can be created by means of a rotating wheel equipped around its circumference with massive spheres. It was assumed that the gravitational field of spheres is determined by the Newton delay potential. The stationary receivers of alternating gravitational field would be located within the plane of the wheel. The receivers can be considered as mechanical oscillators tuned to the frequency of alternating gravitational field. The shift between oscillations of the alternating gravitational field during the rotation of the wheel in one

Card 1/3

direction will be:

$$\varphi_+ = \varphi_0 + \omega\Delta l/c, \quad \varphi_0 = \omega\Delta l/c. \tag{1}$$

Here, ω-cyclic frequency of alternating component of the field; c - propagation velocity of gravity; Δl - difference in the distance between receivers from the edge of the wheel; φ - phase shift. With the change in the direction of rotation, the difference in phases will be:

$$\varphi_- = -(\varphi_0 - \omega\Delta l/c). \tag{2}$$

The change in the modulus difference is:

$$\Delta\varphi = 2\omega\Delta l/c. \tag{3}$$

The experimental determination of $\Delta\varphi$ would provide information on the propagation velocity of the

Possibility of Measuring the Velocity of Gravitational Distribution under Laboratory Conditions

77014
SOV/56-37-6-54/55

gravity. There is 1 Soviet reference.

SUBMITTED: July 29, 1959

Card 3/3

21171
S/141/60/003/006/010/025
E192/E382

9.2577
9.2584

AUTHOR: Bershteyn, I.L.

TITLE: Oscillation Fluctuations in a Parametric Oscillator

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1960, Vol. 3, No. 6, pp. 995 - 1000

TEXT: It is known from various experiments that if an oscillatory circuit (a tuned circuit) is provided with the capacitance of a p-n junction and this capacitance is given a biasing voltage of 2-4 V and a comparatively small amplitude of the pump signal (not more than 1-2V), it is possible to achieve parametric excitation or oscillation in the circuit without an appreciable detection effect. In the following, such a system is analysed under the assumption that it is sufficient to consider the nonlinearity of the variable capacitance. The fluctuations of the oscillations in such a system are due to the fluctuation of the pump signal and random electromotive forces caused by the thermal effects in the circuit. The oscillator can be represented by the equivalent circuit shown in Fig. 1. L and R represent the inductance

Card 1 /1 69

Oscillation Fluctuations ....

and the resistance of the circuit and its capacitance is $C + C_1$, where C represents the constant component and C_1 is the variable component; e is the noise voltage in the circuit. A pump signal $U\cos(2\omega + \varphi)$ is applied to the capacitance, such that $U = U_o + u$, where $u \ll U_o$; u and φ represent the amplitude and phase fluctuations of the pump signal. The voltage v across the capacitance and the current in the circuit are related by:

$$Ldi/dt + ri + v = e \qquad (1)$$

$$i = (C + C_1)dv/dt \qquad (2),$$

By denoting $\omega_o = 1/\sqrt{LC} \simeq \omega$ and $\delta = (\omega - \omega_o)/\omega \ll 1$. the two combined equations result in:

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Oscillation Fluctuations ....

$$\frac{d^2v}{dt^2} + \omega^2 v = -\frac{r}{L}\frac{dv}{dt} - \frac{1}{C}\frac{d}{dt}\left(C_1\frac{dv}{dt}\right) + 2\omega^2\delta v + \omega^2 e. \qquad (4) \qquad (4)'.$$

Further, by denoting $x = v$ and $y = \dot{x}/\omega$, the above results in:

$$\dot{x} = \omega y; \qquad (5)$$

$$\dot{y} = -\omega x - \frac{r}{L}y - \frac{1}{C}\frac{d}{dt}(C_1 y) + 2\omega\delta x + \omega e = -\omega x + f(x, y, t),$$

where $f(x, y, t)$ characterises the deviation of the system from an autonomous conservative system. The solution of Eqs. (5) is assumed to be in the form of:

Card 3/10

Oscillation Fluctuations ....

$$x = U\cos(2\omega t + \varphi) + R\cos(\omega t + \vartheta)$$

$$y = -2U\sin(2\omega t + \varphi) - R\sin(\omega t + \vartheta). \quad (6)$$

If it is assumed that $e = 0$ and $dR/dt = \dot{\Phi}$ and $d\vartheta/dt = \dot{\Psi}$, the simplified Van-der-Pol equations for the system are:

$$\dot{\Phi} = -\frac{r}{2L}R - \frac{\omega}{C}\frac{1}{2\pi}\int_0^{2\pi} C_1 y\cos(\omega t + \vartheta)\,d(\omega t); \quad (9)$$

$$\dot{\Psi} = -\omega\delta + \frac{\omega}{CR}\frac{1}{2\pi}\int_0^{2\pi} C_1 y\sin(\omega t + \vartheta)\,d(\omega t). \quad (10)$$

The dependence of C_1 on voltage is expressed by:

$$C_1 = -\beta x + \gamma x^2 \quad (11)$$

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Oscillation Fluctuations ....

Eqs. (9) and (10) can thus easily be solved and the solutions are in the form of:

$$\frac{dR}{dt} = \Phi = -\frac{r}{2L}R + \frac{\omega\beta U}{4C}R\sin(2\vartheta - \varphi); \qquad (12)$$

$$\frac{d\vartheta}{dt} = \Psi = -\omega\delta + \frac{\omega\beta U}{4C}\cos(2\vartheta - \varphi) - \frac{\omega\gamma}{4C}\left(U^2 + \frac{R^2}{2}\right). \qquad (13)$$

Now, the steady-state values R_o and ϑ_o can easily be found from Eqs. (12) and (13) by assuming that $U = U_o$ and $\varphi = 0$. In order to determine the fluctuations of the oscillation of the system it is assumed that $R = R_o + z$ and $\vartheta = \vartheta_o + \varepsilon$. The amplitude and phase fluctuations z and ε can be expressed by:

Card 5/10

$$\frac{dz}{dt}=\left(\frac{\partial\Phi}{\partial R}\right)_0 z+\left(\frac{\partial\Phi}{\partial\vartheta}\right)_0 \varepsilon+\left(\frac{\partial\Phi}{\partial U}\right)_0 u+\left(\frac{\partial\Phi}{\partial\varphi}\right)_0 \varphi; \quad (17)$$

17)

$$\frac{d\varepsilon}{dt}=\left(\frac{\partial\Psi}{\partial R}\right)_0 z+\left(\frac{\partial\Psi}{\partial\vartheta}\right)_0 \varepsilon+\left(\frac{\partial\Psi}{\partial U}\right)_0 u+\left(\frac{\partial\Psi}{\partial\varphi}\right)_0 \varphi. \quad (18)$$

18)

where the values of the derivatives are taken at the mean values of the parameters. The values of R_o and ϑ_o are stable if $p_1 > 0$ and $p_2 > 0$, where:

$$p_1=\omega/Q;\quad p_2=\gamma R_0^2\frac{\omega^2\beta U_0}{8C^2}\frac{\gamma\alpha^2-1}{\alpha}. \quad (20)$$

where Q is the quality factor of the resonant circuit. By assuming that

Oscillation Fluctuations ....

$u = u_m e^{j\Omega t}$, $\varphi = \varphi_m e^{j\Omega t}$, $z = z_m e^{j\Omega t}$ and $\varepsilon = \varepsilon_m e^{j\Omega t}$, the values of z_m and e_m are given by:

$$z_m = \frac{1}{p_2 - \Omega^2 + j\Omega p_1}\left\{\left[\frac{\omega^2 \beta R_0 U_0}{4C^2}\left(\frac{\beta}{2} - \gamma U_0 \frac{\sqrt{\alpha^2 - 1}}{\alpha}\right) + j\Omega \frac{\omega}{2Q}\frac{R_0}{U_0}\right] u_m - \right. \quad (21)$$

$$\left. - j\Omega \frac{\omega \beta U_0 R_0}{4C} \frac{\sqrt{\alpha^2 - 1}}{\alpha} \varphi_m \right\};$$

$$\varepsilon_m = \frac{1}{p_2 - \Omega^2 + j\Omega p_1}\left\{\left[-\frac{\omega^2 \gamma R_0^2}{8CQU_0} + j\Omega \frac{\omega}{2C}\left(\frac{\beta}{2}\frac{\sqrt{\alpha^2 - 1}}{\alpha} - \gamma U_0\right)\right] u_m + \right. \quad (22)$$

$$\left. + \frac{1}{2}(p_2 + j\Omega p_1)\varphi_m \right\}.$$

Card 7/10

Oscillation Fluctuations ....

In general, these equations are unwieldy for calculations but they can be simplified in special cases. Thus, the fluctuations due to the noise in the tuned circuit can easily be determined. The amplitude and the phase fluctuations for this case are expressed by:

$$\overline{z_\Omega^2} = \frac{1}{(p_2 - \Omega^2)^2 + \Omega^2 p_1^2}\left[p_1^2 + (p_1\sqrt{\alpha^2 - 1} - \Omega)^2\right]\frac{\omega^2 rkT}{\pi}; \qquad (27) \qquad (27)$$

$$\overline{z_\Omega^2} = \frac{1}{(p_2 - \Omega^2)^2 + \Omega^2 p_1^2}\left[\frac{\omega\gamma R_0^2}{4C} - \Omega\right]^2 \frac{\omega^2 rkT}{\pi R_0^2}. \qquad (28) \qquad (28)$$

The above formulae were used to calculate the amplitude and phase fluctuation spectra for an oscillator for the frequency band from 0 to 200 Mc/s. In Fig. 3 , Curve 1 shows the relative values of the fluctuations due to the pump signal fluctuations, Curve 2 gives the values of the amplitude

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Oscillation Fluctuations ....

fluctuation due to the phase fluctuation of the pump signal and Curve 3 gives the amplitude fluctuations due to the thermal effect; similarly, Curves 4, 5 and 6 give the values of the phase fluctuations due to the above three noise sources. There are 3 figures.

ASSOCIATION: Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Scientific Research Radiophysics Institute of Gor'kiy University)

SUBMITTED: September 20, 1960

Card 9/10

S/141/61/004/003/013/020
30762
E192/E382

6.4400
9.2670

AUTHORS: Bershteyn, I.L. and Goronina, K.A.

TITLE: Sensitivity of radio-receiving equipment

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, v. 4, no. 3, 1961, pp. 515 - 520

TEXT: The noise characteristics of a high-frequency amplifier are usually determined by a noise figure N or the so-called noise temperature $\Delta T = (N - 1)T_o$ where $T_o = 290\ ^oC$. However, if a system comprises an amplifier and other circuits following the amplifier, the parameters N of the amplifier and the effective passband Π do not completely describe the sensitivity of the system as a whole. For the purpose of analysis, it is assumed that the amplifier is followed by a square detector. The DC component at its output I is proportional to the power at the input of the amplifier, which is equal to the sum of the noise power $P_ш$ and the signal P_c. If P_c is varied from one known value to another

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Sensitivity of ....

and the corresponding changes of I are observed, it is possible to determine N for a given amplifier. It should be borne in mind, however, that, in practice, the detection of a signal is not equivalent to the measurement of the quantity I. If the spectral density of noise at a frequency F at the output of the detector is denoted by i_F^2 the mean square noise at the output of the system as a whole for the case of compensation and modulation methods of reception is proportional to

$$\delta i = \sqrt{\int i_F^2 \Delta F}\Big|_{F=0}$$ where ΔF is the bandwidth at the output of the system which is of the same order as the quantity $1/\tau_H$ (τ_H is the time constant of the output circuit). In order to determine the useful signal at the output of the system, it is assumed that in the absence of a signal at the input of the amplifier, the system contains the noise $P_ш$ and the background radiation noise $P_Ф$. Consequently:

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$$I = \beta_o(P_{ш} + P_{ф}) = \beta_o k \Pi\left[(N - 1)T_o + T_{ф}\right] \qquad (2)$$

where β_o - a constant coefficient for the given equipment. If the signal $P_c \ll P_{ш}$ and $P_{ф}$ is applied to the system, I changes by an amount $\Delta I = \beta_o P_c$. If the compensation method of reception is employed, the useful signal at the output is proportional to this quantity. Thus, by comparing ΔI and δi , the threshold signal power is expressed by:

$$P_{п} = \frac{\delta i}{\beta_o} = \frac{I}{\beta_o}\frac{\delta i}{I} = \left\{k \Pi\left[(N - 1)T_o + T_{ф}\right]\right\}\frac{\delta i}{I} \qquad (3) .$$

It is seen that the multiplier $\delta i/I$ determines the gain due to the compensation method of reception. In the case of the modulation method, the quantity $P_{п}$ is also determined by

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Eq. (3), provided an additional coefficient is introduced; this coefficient should depend on the modulation law of the signal. The first factor in Eq. (3) (in brackets) is fully determined by the parameters Π and N of the amplifier and the quantity T_0. On the other hand, the second factor $\delta i/I$ depends on the type of amplifier. In the case of a normal amplifier, this quantity is given by:

$$\frac{\delta i}{I} = \sqrt{\frac{2\Delta F}{\Pi}} \qquad (5) .$$

For a single-tuned parametric amplifier, shown in Fig. 1, the above quantity is expressed by:

$$\frac{\delta i}{I} = \sqrt{\frac{2\Delta F}{\Pi}} \sqrt{1 + \frac{4\alpha^2}{(1+\alpha^2)^2}} \qquad (12)$$

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where α is defined by:

$$\frac{1}{\left[1 - (\Delta C)^2/4\pi^2\nu^2C_o^4R^2\right]^2} = \frac{1}{(1 - \alpha^2)^2} \qquad (7) .$$

In the above (see Fig. 1), the capacitance of the circuit changes in accordance with $C = C_o + \Delta C \sin(2\pi\nu t)$, where ν is the pump frequency. By comparing Eqs. (12) and (5), it is seen that for the same values of N and Π the threshold signal is $\sqrt{2}$ times greater in the case of the parametric amplifier than for the normal amplifier. A super-regenerative amplifier operating at the frequency $F_q = 1/T_q$ is also considered and it is shown that for this case the ratio $\delta i/I$ is expressed by:

$$\frac{\delta i}{I} = \sqrt{\frac{2\Delta F}{F_q}} \qquad (20) .$$

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From this it is seen that $\delta i/I$ is $\sqrt{\Pi/F_q}$ times greater for the super-regenerative amplifier than for the normal amplifier. The passband of the super-regenerator Π is substantially larger than F_q. It is seen, therefore, that a super-regenerative amplifier (when combined with the modulation or compensation methods of reception) gives a threshold signal of about two to three times higher than the normal amplifier with the same values of N and Π.
There are 2 figures and 2 Soviet references.

ASSOCIATION: Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Scientific Research Radiophysics Institute of Gor'kiy University)

SUBMITTED: February 8, 1961

Card 6/16

ACCESSION NR: AP4039733 S/0141/64/007/002/0328/0337

AUTHOR: Bershteyn, I. L.

TITLE: Oscillator frequency fluctuations in systems with automatic frequency control circuits

SOURCE: IVUZ. Radiofizika, v. 7, no. 2, 1964, 328-337

TOPIC TAGS: oscillator, phase control, frequency control, automatic control system, spectrum analysis

ABSTRACT: Unlike most investigations that deal with the stabilization of some average oscillator frequency, the present article deals with the reduction of frequency fluctuations within some specified band by using automatic frequency and phase control circuits. This is done by determining the spectral density of the frequency fluctuations that result from the use of various automatic circuits and by determining the limits to which these fluctuations can be reduced.

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ACCESSION NR: AP4039733

Principal attention is paid to fluctuations due to variations in the oscillator-circuit parameters, fluctuations which predominate at higher frequencies and which are assumed to increase in inverse proportion to the frequency. Three variants of frequency control and one variant of phase control systems are considered from the point of view of the influence of the circuit parameters on the spectral density of the frequency fluctuations. It is tentatively concluded that in the presence of a highly stabilized reference signal the phase control system is preferable at low frequencies. At higher frequencies (on the order of tens of kilocycles) the results are inconclusive. Orig. art. has: 1 figure and 18 formulas.

ASSOCIATION: Nauchno issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Scientific Research Radiophysics Institute at the Gor'kiy University)

SUBMITTED: 10Jul63 DATE ACQ: 19Jun64 ENCL: 00

SUB CODE: EC NR REF SOV: 012 OTHER: 001

Card 2/2

L 2560-66 EWA(k)/FBD/EWT(1)/EEC(k)-2/T/EWP(k)/EWA(m)-2/EWA(h) SCTB/IJP(c) WG
ACCESSION NR: AP5024718 UR/0056/65/049/003/0953/0959

AUTHOR: Bershteyn, I. L.; Zaytsev, Yu. I. 44 44 54 52 B

TITLE: Operation of a gas laser with a ring cavity resonator 25,44

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 3, 1965, 953-959

TOPIC TAGS: laser, gas laser, laser cavity, laser mode, ring cavity

ABSTRACT: The phase relationships between longitudinal modes of a gas laser with a ring cavity were studied. The method proposed for determining the relationships was based on the assumption of the highest degree of "smoothing out" of the distribution of the electric field intensity of the light wave along the active medium. The results of the calculations were confirmed by measurements of the modulation depth of the photocurrent during splitting (e.g., due to rotation) of the wave frequencies generated in the system. The experiments were performed at the 0.63μ wavelength using a three-mirror arrangement. The effect of small variations of the

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ACCESSION NR: AP5024718

2

cavity length on the photocurrent was also considered. Orig. art. has: 2 figures and 4 formulas.
[CS]

ASSOCIATION: Radiofizicheskiy institut Gor'kovskogo gosudarstvennogo universiteta (Radiophysics Institute, Gor'kiy State University)

SUBMITTED: 19Apr65 ENCL: 00 SUB CODE: ECQP

NO REF SOV: 001 OTHER: 005 ATD PRESS: 4108

Card 2/2

L 09410-67 EWT(d)/EWT(l) IJP(c) WW
ACC NR: AP6020943 SOURCE CODE: UR/0141/66/009/004/0835/0836

AUTHOR: Bershteyn, I. L.

ORG: Scientific Research Radiophysics Institute at the Gor'kiy University (Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete)

TITLE: Possible method of measuring the inversion temperature of a medium

SOURCE: IVUZ. Radiofizika, v. 9, no. 4, 1966, 835-836

TOPIC TAGS: population inversion, molecular spectrum, laser emission, radiation intensity

ABSTRACT: The author disagrees with the method proposed by R. A. Paananen et al. (J. Appl. Phys. Letters v. 4, no. 8, 149, 1964) for determining the degree of inversion, defined as $x = (N_n/g_n)/(N_m/g_m)$, where n and m are respectively the upper and lower energy levels of a molecule, the transition between which is considered, and N_i and g_i are the populations and multiplicity of degeneracy of the level i, and presents reasons for his disagreement. He then calls attention to a relatively simple possibility of experimentally determining the value of x in the medium without going over into the generation mode. The method is based on the fact that usually when the parameter that causes inversion in the system is varied, the level populations do not vary in proportion to each other. By measuring the intensities of the spontaneous

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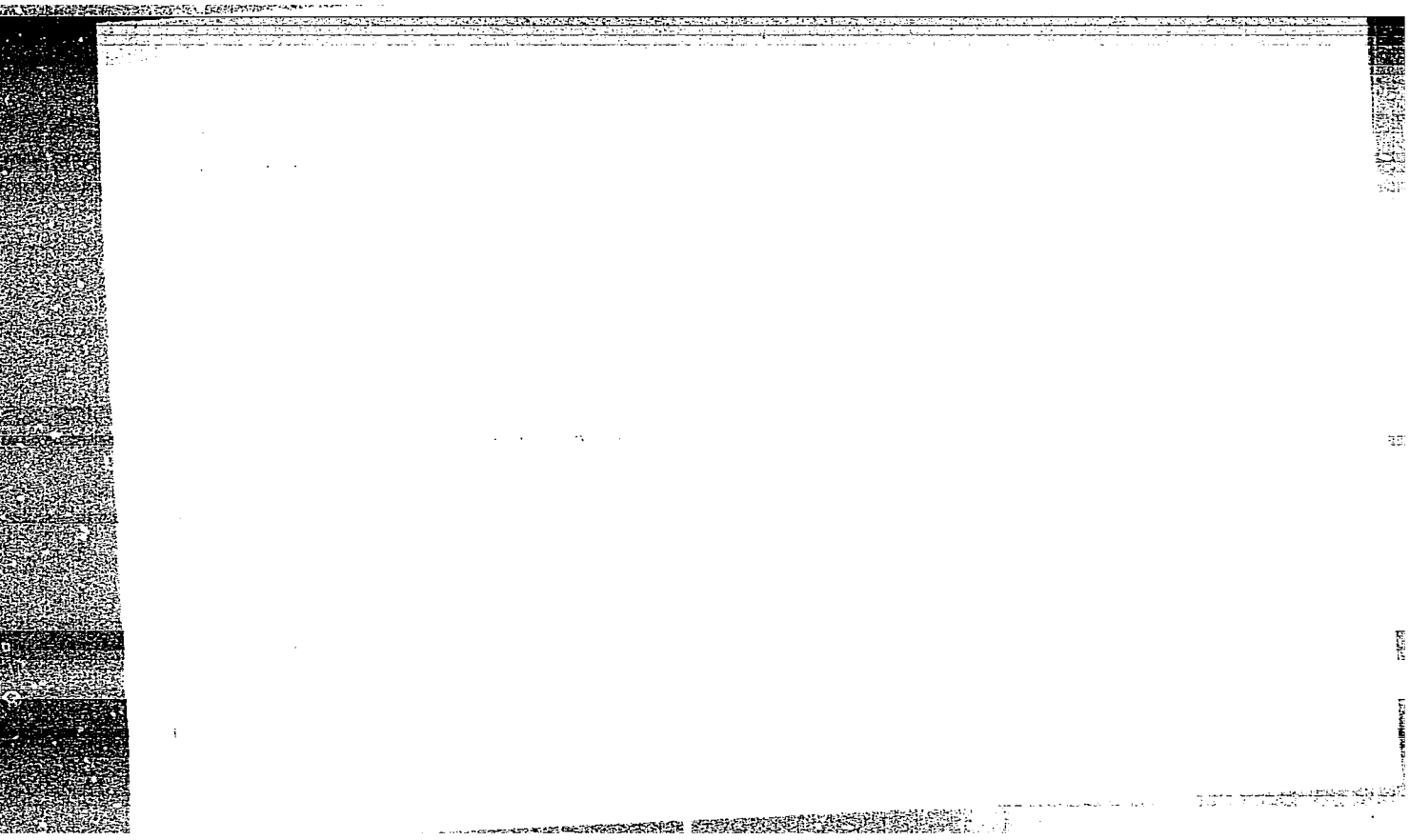
L 09410-67
ACC NR: AP6026943

emission from the levels of interest at different values of the excitation parameter one can determine the proportionality coefficient between the intensity and the population for both cases and from them, by taking into account the gains in the two cases, the value of x. A numerical example, based on data presented in a paper by A. D. White and E. I. Gordon (Applied Physics Letters v. 3, no. 11, 197, 1963), is presented. Orig. art. has: 4 formulas

SUB CODE: 20/ SUBM DATE: 04Mar66/ ORIG REF: 000/ OTH REF: 003

Card 2/2

[redacted] entrainment band of a laser generator



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KAMINSKIY, Yu.L.; BERSHTEYN, I.Ya.; GINZBURG, O.F.

Determination of the tautomeric ion content in solutions of p-aminoazobenzene and its derivatives. Dokl.AN SSSR 145 no.2:330-331 Jl '62. (MIRA 15:7)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta. Predstavleno akademikom M.I.Kabachnikom.

(Aniline) (Tautomerism)